CENTER FOR BEAM PHYSICS SEMINAR

"Frequency-Chirped SASE FEL"

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SSRL/SLAC

Friday March 14, 2003, 10:30 AM
Albert Ghiorso Conference Room (71-264), LBNL
•••*Refreshments served at 10:20 AM* •••

Abstract: We present a statistical analysis of the temporal and spectral properties of SASE radiation from an energy-chirped electron beam passing through a long undulator. It is found that the coherence time is independent of the chirp, while the range of spectral coherence is linearly proportional to it. We consider the use of a monochromator to pick out a small temporal slice of the radiation output. For the filtered radiation pulse, we determine the pulse duration, the number of modes, and the energy fluctuation. We apply our analysis to schemes proposed to generate short x-ray pulses at the LCLS.

Biographical data and research interests: Samuel Krinsky did his undergraduate studies at MIT and received a Ph.D. in Physics from Yale University. After working on the theory of phase transitions at the Institute for Theoretical Physics at SUNY-Stony Brook and the Brookhaven National Laboratory Physics Department, he joined the NSLS in 1977, where he was responsible for the design and commissioning of the NSLS X-Ray storage ring. He served as Deputy Chair of the NSLS from 1985-2001. His research interests are in the areas of particle beam dynamics, undulators, and wigglers as sources of radiation, and free electron lasers. He is a fellow of the American Physical Society.